

Device for operating a sun shade, an umbrella or the like.

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BACKGROUND OF THE INVENTION

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1. Field of the Invention

The present invention concerns a device for operating a sun shade, an umbrella or the like.

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2. Discussion of the Related Art

Such devices are already known which mainly consist of a vertical support and an arm which is hinge-mounted on said support and upon which is hinge-mounted a shade.

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A disadvantage of such known devices is that the erection of the shade and folding back the shade and the arm after its use is relatively difficult and time-consuming.

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SUMMARY OF THE INVENTION

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The present invention aims a device which excludes the disadvantages of the known devices and which to this aim offers a device which makes it possible to operate a shade in an entirely automatic manner.

To this end, the invention concerns a device for operating a sun shade, umbrella or the like, of the type which mainly consists of an upward directed support and an arm which is
5 fixed to the support by means of a hinge pin and onto which is hinge-mounted a shade, whereby this shade at least consists of a flange onto which ribs are hinge-mounted, and of a bush which is connected to the aforesaid ribs by means of spokes, characterised in that the device is provided
10 with means for folding and unfolding the arm between the folded position, whereby the arm lies against, or practically against the support, and an unfolded position whereby the arm is mainly directed crosswise to the support; means for rotating the shade, when unfolding or
15 folding the arm, in relation to the aforesaid arm; and means for opening and closing the shade.

BRIEF DESCRIPTION OF THE DRAWINGS

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In order to better explain the characteristics of the invention, the following preferred embodiments of a device according to the invention for operating a shade are
25 described as an example only without being limitative in any way, with reference to the accompanying drawings, in which:

figure 1 schematically represents a view in
30 perspective of a device according to the invention when folded;

figure 2 represents the device from figure 1, when unfolded;

figure 3 represents a section according to line III-III in figure 1;

5 figure 4 represents a section as in figure 3, but for a partially unfolded position;

figure 5 represents a section as in figure 3, but in the unfolded position according to figure 2;

10 figures 6 and 7 represent sections according to lines VI-VI and VII-VII respectively in figure 4, to a larger scale;

figure 8 represents the part indicated by F8 in figure 4 to yet a larger scale;

15 figure 9 represents a variant of a device according to the invention whereby two shades are applied.

DESCRIPTION OF THE PREFERRED EMBODIMENT

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Figures 1 to 8 represent a device according to the invention, which mainly consists of an upward directed, preferably vertical support 1 with a hinge-mounted arm 2 onto which is fixed a shade 3.

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The above-mentioned support 1 is in this case formed of a telescopic mast which is mainly composed of a fixed part on the one hand formed of a lower tubular pipe 4 which is fixed with its lower end on a base plate 5, and of an
30 extending part consisting of an upper tubular pipe 6 provided in the lower tube and whose lower end is sealed by

a cross wall 7 with a central passage 8 in which screw thread has been provided on the other hand.

5 In the lower pipe is provided a drive in the shape of a tubular motor 9 which is fixed in the pipe in any way whatsoever, for example by means of a locking pin 10 which is provided through passages in two opposite walls, 11 and 12 respectively, of the lower pipe 4 and which is provided through a bore hole in the body of the motor 9.

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The outgoing shaft 13 of this tubular motor 9 is provided with screw thread working in conjunction with the above-mentioned screw thread in the cross wall 7 of the upper pipe 6.

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In this upper pipe 6 is provided a second drive in the shape of a second tubular motor 14 provided with a cable pulley 16 on its outgoing shaft 15 protruding from the top end of the pipe 6 concerned.

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The body of the second tubular motor 14 is fixed in the upper pipe 6 in an analogous manner as the first tubular motor 9 by means of a similar locking pin 10 provided through passages in two opposite walls, 17 and 18
25 respectively, of the upper pipe 6.

At the top end of the upper pipe 6 is provided a slantingly directed plate 19 on the aforesaid wall 17 which is for example welded onto the aforesaid wall 17 with one edge and
30 which is provided with a horizontal bush 20 fixed to the

plate 19, for example by means of welding, at its free edge opposite to the aforesaid welded edge.

5 In the given example, the aforesaid arm 2 consists of a U-shaped strut 21 with a back wall 22 and two parallel side walls 23 which have been extended over a certain distance on both their far ends.

10 On the extended parts of the side walls 23 are provided ears, two ears 24 respectively on one far end of the arm 2 and two ears 25 on the other far end of the arm 2, with opposite passages, 26 and 27 respectively.

15 The above-mentioned arm 2 is fixed to the support 1 with one far end by means of a hinge pin 28, which is provided through the aforesaid passages 26 in the ears 24 on the one hand, and through the aforesaid bush 20 of the upper pipe 6 on the other hand, such that the back wall 22 of the arm 2 is directed upward when the arm is provided horizontally.

20 Between the fixed part of the support 1 and the arm 2 has been provided a bar 29 which is hinge-mounted at one far end between two ears 31 on the wall 11 of the lower pipe 4 by means of a shaft 30, and which protrudes through a
25 groove 32 in the back wall 22 of the arm 2 with its other far end, and which is hinge-mounted with this far end to a shaft 33 provided between two ears 34 on the back wall 22 of the arm 2.

30 Between the ears 25 at the free end of the arm 2 has been provided an upward directed cylindrical shaft 35 which is

part of the aforesaid shade 3 and which is hinge-mounted to the arm 2 by means of a shaft 36 provided through the passages 27 in the above-mentioned ears 25 and through a radial bore hole 37 in the bush 35.

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On the above-mentioned shaft 36 is provided a cable guide in the shape of a cable wheel 38 or the like.

At the height of the shaft 37, in the wall of the aforesaid bush 35, is provided an opening 39 directed towards the support.

The bush 35 is connected to the moving part of the support 1 by means of a bar 40, whereby this bar 40 is hinge-mounted on a shaft 41 on one far end which is fixed between two ears 42 situated on the lower side of the above-mentioned plate 19 of the moving part of the support 1, whereas the other far end of the bar 40 is hinge-mounted to a shaft 43 which is supported by two ears 44 on the bush 35.

The bar 40 has been provided between the side walls 23 of the arm 2 in a concealed manner.

The spokes 45 of the shade 3 are hinge-mounted to the bush 35 with one far end 46 in the known manner, and they are hinge-mounted to the ribs 48 of the shade 3 with their other far end 47, which are themselves hinge-mounted with one far end 49 to a flange 50 which is provided with a short bar 51 at the top end which is coaxially provided in relation to the above-mentioned bush 35 of the shade 3 and

which is provided with a conical part 52 at its lower end, onto which is fixed a cable 53, a rope or the like.

5 The cable 53 is guided over the above-mentioned cable wheel 38 and through the opening 39 into the bush 35, and it is wound with one part on the above-mentioned cable pulley 16 of the upper tubular motor 14.

10 The cloth 54 of the shade 3 is represented as a dashed line in the figures, and it is fixed to the ribs 48 in the known manner.

The working and use of the device according to the invention is very simple and as follows.

15 Figures 1 and 3 represent the device as folded, whereby the telescopic support 1 is extended, the arm 2 on the support 1 is rotated down up against the support 1, and the shade 3 is folded up against the arm 2.

20 In order to unfold the arm 2, the lower tubular motor 9 is excited, for example by operating a non-represented push button which closes an electric circuit in which the tubular motor 9 is inserted.

25 Thanks to the cooperation of the screw thread on the shaft 13 of the motor 9 and the screw thread in the cross wall 7 of the upper pipe 4, the moving part of the telescopic support 1 is pushed in, as a result of which the bar 29,
30 which connects the arm 2 to the lower pipe 4 of the support

1, pushes the arm 2 up and makes it tilt into the horizontal position of figure 4.

As the bush 35 of the shade 3 is connected to the support 1
5 by means of the bar 40, said bush 35 is rotated in relation to the arm 2 simultaneously with the rotational movement of the arm 2.

The length of the bar 40 is selected such that the centre
10 distance A between the hinge pins 41 and 43 of this bar 40 is equal to the centre distance B between the hinge pin 28 of the arm 2 and the hinge pin 36 of the bush 35, while the position of the ears 44 on the bush 35 is selected such that the centre distance C between the hinge pins 36 and 43
15 at one far end of the arm 2 is equal to the centre distance D between the hinge pins 28 and 41 on the other far end of the arm 2, which comes down to it that the above-mentioned hinge pins 28-36-41-43 are always situated at the angular points of an imaginary parallelogram represented in figure
20 7 by means of a dashed line.

It is clear that, as a result, the connecting line between the shafts 36 and 43 of the bush 35 always remains parallel to the connecting line between the shafts 28 and 41 on the
25 support 1 and that, consequently, the bush 35 of the shade 3, and thus also the shade 3 itself, always remains parallel to itself in an upward directed position.

Starting from the situation in figure 4, the upper tubular
30 motor 14 is then activated by operating a non-represented

push button which closes an electric circuit in which the tubular motor 14 is inserted.

As a result, the cable 53 which is fixed to the bar 51 of
5 the shade 3 is wound onto the cable pulley 16, as a result
of which this bar 51 is pulled down and the ribs 48, as a
result thereof, are pushed away from each other until, as
represented in figures 2 and 5, the shade 3 is entirely
unfolded and the conical part 52 of the bar 51 rests on the
10 bush 35.

Summing up, it may be stated that the device comprises
means for unfolding the arm 2 in the shape of a telescopic
support 1 and of a bar connection 29; means to rotate the
15 shade 3 in relation to the arm 2 when the arm 2 is rotated,
whereby these means are formed of the above-mentioned bar
connection 40; and finally means for opening and closing
the shade 3, whereby these means consist of the motor 14
and the cable connection 53.

20 Starting from the unfolded position in figures 2 and 5, the
shade 3 can be folded again just as simply by successively
activating, in reverse order, the upper tubular motor 14
and then the lower tubular motor 9 in the opposite sense as
25 described above, whereby the shade 3, due to the weight of
the cloth 54, will be automatically folded.

If required, springs or the like can be provided between
for example the spokes 45 and the ribs 48 which are
30 tightened when the shade 3 is unfolded and which, when the
cable 53 is veered, automatically close the shade 3 again.

It is clear that both drives must not necessarily be operated separately, but that it is also possible to open or close the shade 3 simultaneously with the opening or
5 closing of the arm 2, either or not with a certain delay.

It is clear that the above-mentioned drive of the arm 2 can also be embodied in another manner than by a motor with threaded shaft as described above.

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Thus, for example, use can be made of any drive whatsoever provided between the fixed part and the moving part of the support, either internally or externally, whereby this drive can be any linear motor whatsoever or can for example
15 also have the shape of a hydraulic or pneumatic cylinder or the like.

Figure 9 represents a variant of a device according to the invention, whereby two shades 3 are applied in this case,
20 each on a separate arm 2, but whereby both these arms are provided on a common telescopic support 1 and whereby the cables 53 of these shades 3 are wound on two separate cable pulleys 16 which are fixed together on the outgoing shaft 15 of a common tubular motor 14.

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The working of this device is entirely analogous to the above-described embodiment, with this difference that both arms 2 and both shades 3 are unfolded simultaneously and synchronously.

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Of course, it is also possible to apply more than two shades 3 to a common support 1.

Although in the figures, the support 1 with its base plate
5 5 is fixed on the ground, it is not excluded for the fixed
part of the support 1 to be fixed against a wall or the
like, in this case without a base plate 5.

It is clear that the bar 51 on the flange 50 of the shade 3
10 can be left out if necessary, whereby the cable 53 can be
fixed directly to the flange 50 in this case.

The invention is by no means limited to the above-described
embodiments given as an example and represented in the
15 accompanying drawings; on the contrary, such a device
according to the invention can be made in all sorts of
shapes and dimensions while still remaining within the
scope of the invention.